

AMENDMENTS TO THE SPECIFICATION

Please amend the Specification beginning on page 8, following line 15, as follows:

Fig. 12 is a perspective view showing one embodiment of a device for directing the fastener applier.

Fig. 13 is a perspective view showing the device of Fig. 12 upon insertion within the deployed endovascular graft of Fig. 3 with both the graft and scaffolding broken away.

Fig. 14 is a perspective view of the device of Fig. 12 showing activation of one embodiment of a stabilizing device attached to the directing device.

Fig. 15 is a perspective view of the control assembly articulating the directing device of Fig. 12.

Fig. 16 is one embodiment of the fastener applier.

Fig. 16A is a detail view of the distal end of the fastener applier shown in Fig. 16.

Fig. 17 is a perspective view of the fastener applier of Fig. 16 being positioned within directing device of Fig. 12.

Fig. 18 is an enlarged cross-sectional view of one embodiment of the fastener applier of Fig. 16.

Fig. 19 is an enlarged cross-sectional view of the attachment applier showing one embodiment of the proximal end of the helical fastener and the drive mechanism.

Fig. 20 is a enlarged perspective view of one embodiment of the helical fastener of Fig. 18;

Fig. 21 is an enlarged view of the attachment applier showing one embodiment of the control assembly that activates the fastener applier.

Fig. 22 is an enlarged view of the attachment applied activated with a fastener implanted into the graft and vessel wall.

Fig. 23 is an enlarged view of the completed attachment of the proximal graft of Fig. 3 to the vessel wall with fasteners.

Please amend the paragraph beginning on page 8, line 26 and ending on page 9, line 12, as follows:

The trunk 12 also desirably includes at least one fastening region 26 that accommodates the introduction of one or more fasteners 28 to anchor the prosthesis 10 in place (see Fig. 3). It is desirable that this region 26 of the trunk 12 be specially sized and configured for the receipt and retention of fasteners 28. For example, the size and spacing of ring stent patterns can be configured in the region 26 to specially accommodate the placement of fasteners; and/or woven fibers with an "X-pattern" or a "sinusoidal pattern" can be used in the region 26 to specially accommodate placement of fasteners; and/or the prosthetic material 14 can be folded-over to form multiple layers, to reinforce the prosthesis in the region 26 where fasteners are placed; and/or denser weave patterns or stronger fibers can be used, selected from, e.g., Kevlar™ KEVLAR material or Vectran™ VECTRAN material or metallic wire woven alone or interwoven with typical polyester fibers in the region 26 where fasteners are placed. It may also be desirable to fluoroscopically indicate this region 26 with auxiliary radiopaque markers 30 on the prosthetic material 14, and/or auxiliary stent rings 32 (not shown) to aid in positioning the fasteners.

Please amend the Specification beginning on page 9, line 15 as follows:

Desirably, like the prosthesis 10 itself, the fasteners 28 are introduced by an intra-vascular fastener attachment assembly. Details of a fastener attachment assembly that deploys helical fasteners can be found in United States Patent Application Serial No. 10/307,226, filed November 29, 2002, and United States Patent Application Serial No. 10/271,334, filed October 15, 2002 (now United States Patent No. 6,960,217), which ~~is~~ are incorporated herein by reference.

Introduction of the fasteners will typically be effected after the prosthesis has been initially placed. That is initial placement will be achieved by self-expansion or balloon expansion, after which the prosthesis is secured or anchored in place by the introduction of a plurality of individual fasteners 28, preferably helical fasteners which are rotated and "screwed into" the prosthesis 10 and vessel wall. Fasteners 28 may be placed through fastening region 26, as Fig. 3 shows.

In the exemplary embodiment, the fasteners 28 are helical fasteners, which are introduced singly, i.e., one at a time, in a circumferentially spaced-apart pattern over an interior wall of the prosthesis 10. Usually, the fasteners 28 will be introduced using a fastener applier which carries a single fastener 28. Fastener appliers which carry a single fastener 28 can have a lower profile and may be more effective and less traumatic than fastener appliers which carry multiple fasteners. The

present invention, however, does contemplate that in certain embodiments the fastener applier may carry multiple fasteners 28. Moreover, the fastener applier may simultaneously deploy multiple fasteners in the preferred circumferentially spaced-apart space pattern described above. Usually, from 2-12 fasteners 28 will be applied at each end of the prosthesis 10 to be anchored. The 2-12 fasteners will usually be applied in a single circumferentially space-apart row that may be applied in more than one row with individual fasteners being axially aligned or circumferentially staggered. In a preferred embodiment, the intraluminal fastener applier comprises a guide component and an applier component. The guide component, for example, comprises a tubular body having a deflectable distal tip and, optionally, a stabilizer for holding the deflected tip against a location in the graft to which the fastener is to be applied. The applier component is insertable through a lumen of the guide component and carries at least a single helical or other fastener. A rotation driver is provided for rotating and advancing the helical fastener so that it penetrates the graft and underlying vessel wall to anchor the graft firmly in place.

Fig. 12 depicts one embodiment of the directing device 118 with an obturator 119 positioned within the lumen of the directing device and extending past the distal of the tip of the directing device. The obturator 119 has a lumen to allow for delivery over a guidewire 112 (see Fig. 13). Fig. 13 depicts the directing device 118 being positioned within the deployed endovascular prosthesis 10 over a guidewire 112 in the region of an abdominal aortic aneurysm 111. The directing device 118 has an incorporated stabilizing device 120 to aid in maintaining position of the directing device 118 within the vessel. In one embodiment, the stabilizing device 120 is spring-loaded and is positioned for use when the obturator in the directing device 118 is removed (see Fig. 14). The directing device 118 is activated though a control assembly 121 as seen in Fig. 14. In one embodiment the control assembly 121 features a movable wheel or lever 122 (see Fig. 15), which deflects the distal tip 123 of the directing device 118 to the desired location as seen in Fig. 15. It is contemplated that the control assembly 121 for the directing device 118 could be activated mechanically, electrically, hydraulically or pneumatically. The control assembly 121 has a through lumen to allow for the passage of the obturator 119 and fastener applier 127 (see Fig. 17). The stabilizing device 120 could be use to stabilize the directing device 118 either concentrically or eccentrically within the vessel.

Fig. 16 depicts one embodiment of the fastener applier 127. Fig. 16A is a detail view of the distal end of the fastener applier 127. Fig. 17 depicts the fastener applier being positioned through the lumen of the directing device 118 to the site where a fastener will be installed.

Fig. 18 is an enlarged cross-sectional view of fastener applier 127 and directing device 118. In one embodiment of the fastener applier 127 the helical fastener 28 is rotated via a fastener driver 129 through a drive shaft 130 that is connected to the control assembly 131 (see Fig. 17). The drive shaft 130 can be made of any material that allows for both bending and rotation. The drive shaft 130 is connected to the fastener driver 129, which engages and imparts torque to the helical fastener 28. Fig. 18 illustrates the coils of the helical fastener 28 engaged with internal grooves 132 within the fastener applier 127. It is contemplated that the grooves 132 could be positioned along the entire length of the fastener or within a portion of its length. Fig. 19 is an enlarged cross-sectional view of the fastener applier 127 with a cross-section of the fastener driver 129 depicting one embodiment of engagement between the fastener driver 129 and helical fastener 28. In this embodiment (see Fig. 20) the proximal coil of the helical fastener 28 is formed to produce a diagonal member 133, which crosses the diameter of the helical fastener 28.

Fig. 20 depicts one embodiment of the helical fastener 28 showing the diagonal member 133. Fig. 21 depicts one embodiment of the fastener applier 127 during activation of the fastener applier control assembly 131. Activation of the control assembly 131 rotates the drive shaft 130, faster driver 129 and helical fastener 28. This rotation causes the helical fastener 28 to travel within the internal grooves 132 of the fastener applier 127 and into the fastening region 26 of the prosthesis 10 and vessel wall 134 (see Fig. 22). It is contemplated that the control assembly 131 for the fastener applier 127 could be activated mechanically, electrically, hydraulically or pneumatically.

Fig. 23 illustrates a completed helical fastener 28 attachment of the prosthesis 10 to the vessel wall 34. It is contemplated that one or more fasteners 28 will be required to provide secure attachment of the graft to the vessel wall.

Please amend the Specification in the paragraph that begins on page 10, line 24 and ends on page 11, line 5, as follows:

It is desirable that the socket region 40 of the trunk 12 be specially sized and configured for the receipt and retention of the auxiliary graft 36, e.g., by the use of folded-over materials to form

multiple layers, and/or the use of denser weave patterns or stronger fibers from, e.g., ~~Kevlar™~~ KEVLAR material or ~~Vectran™~~ VECTRAN material or metallic wire woven alone or interwoven with typical polyester fibers in the socket region 40, additional stent rings, and the like, to reinforce the prosthesis in the socket region 40 where hooks or barbs 60 of the graft 36 can obtain purchase; and/or by the use of radiopaque markers 42 ~~30~~ to fluoroscopically identify the socket region 40 on the prosthetic material 14; and/or the use of auxiliary stent rings on the inside of the prosthetic material 14 in the socket region 40 that interfere with exterior stent rings on the graft 36, to resist migration of graft 36 from the prosthesis 10.